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THE FIVE PORTS OF CHINA OPEN TO THE BRITISH TRADE.

EUROPEAN FACTORIES AT CANTON.

V. Canton.

For the sake of rendering a complete account of our trading ports in China, we include Canton in the list; although this is not a newly opened port, but, on the contrary, has been, from a distant period, the only really available channel of commerce for foreign nations. Three Supplements, in Vols. X., XI., and XII., of the *Saturday Magazine*, have already been devoted to a description of Canton, its situation, trade, inhabitants, &c., and we have only now to add such remarks as more recent information, and the change in the position of this port with respect to English trade, seem to demand.

In returning from Shang-hai, described in our last article, to the port of Canton, we retrace on the map the course already pursued, passing the Chusan group of islands, the port of *Ning-po*, that of *Foo-choo*, and that of *Amoy*. In approaching Canton the island of Hong-Kong claims attention among the numerous islands which are scattered about the entrance of the bay. This island being now ceded to Britain deserves particular notice. We shall therefore describe it in a separate article.

The towns on the banks of the river as we approach Canton have a picturesque appearance, some of them being thickly interspersed with trees. The pagodas are numerous, crowning the summit of the hills, shooting up from the green rice-fields, or overtopping the woods. The general character of this level and fertile country is occasionally varied by the occurrence of masses of granite, forming hills of considerable height. The river is crowded with boats, and the water branches off in all directions into canals, streams and creeks. Over the rice-grounds that lie above Whampoa, the city of Canton appears with its long line of European factories.

With respect to this hitherto important city, it has been truly remarked in a leading journal of the day, that unless fresh misunderstandings occur between the British and the Chinese, the opening of four new ports to the enterprise of our merchants will soon and materially alter the condition and direction of the eastern tea-districts, and of all the countries which trade with them. To Canton the new arrangement is likely to prove a heavy blow. Its chief articles of export are tea and bullion: the former will henceforth be shipped in preference at the ports in the tea-provinces; and the exportation of silver, if tolerated, can be effected as easily at Shang-hai as at Canton. Commerce will now be more extensively diffused; and with it we may hope, that a numerous train of attendant benefits will visit this hitherto sealed empire.

The number of itinerant workmen and pedlars in Macao attracted Mr. Bingham's attention. He describes the perambulating blacksmith with his portable forge, the bellows and anvil being slung at one end of a pole, while at the other is a basket containing coals, old iron, pan for the fire, &c. The ambulatory barber also is constantly on the move, with a small chest of drawers containing his razor, brush, soap, and a set of instruments for cleaning the ears. When occupied in his vocation, should he not be furnished with his own apparatus for heating water, he will get permission to

boil it at the nearest forge or cook's shop, probably shaving the owner's crown for the boil. The Chinese razor is a most unsightly thing. It consists of a small piece of triangular iron, with a very thick back, opening and shutting into a round wooden handle, yet with this they will make a very clean shave. These itinerant dealers include cooks with their kitchens, pastry-men with their boxes of sweetmeats, glass-menders with tools and rivets, and almost every other trade.

A medical practitioner sat on his mat in the open square with his simples scattered around him. He dealt out medicines and charms of every description. Boluses, powder, and pitch-plaisters seemed to be in great demand. The pills were as big as a boy's marble.

Some of these empirics, (says Mr. B.,) have a peculiar method of cupping: they use two wooden cylinders, which, after having some lighted paper burnt in them, are applied to the intended spot; and upon their removal two bumps are seen, which are then punctured with needles and the mouth applied to draw the blood.

The hinder quarters of frogs are exhibited in the markets at Macao. The Chinese call the frogs *Field Hens*, and regularly fish for them. The angler is furnished with a rod and line, and uses a young frog for a bait, which being bobbed about in the paddy-fields, is quickly seized upon by his larger brethren.

In Macao beggars are numerous, and they possess the curious privilege of entering any shop and making a continued noise with a powerful rattle, until silence is purchased by the shopman or his customers.

In concluding these notices of the five ports of China now open to British trade, we may be allowed to express an earnest hope that the Chinese people may soon experience, not only the beneficial results of an extended trade, and the advantages which usually result from constant intercourse with a highly civilized nation, but also the blessings of the holy religion which we profess. That the Chinese are deeply in need of these blessings will appear the more strikingly if we refer to Professor Kidd's interesting work on China, where we have a full account of the religion, or rather the superstitions of the Chinese. The three principal sects in China are the sect of *Reason*, the sect of *Fuh*, and the sect of the *Learned*. The first of these was founded by *Laou-Keuntsze*, five hundred years before the Christian era, who was contemporary with Confucius. The founder of this sect is described as

the great, supreme, three-fold source, consisting of three personages, of whom the most honourable dwells in heaven, bestowing happiness; the next in rank grants forgiveness of sins on earth; while the inferior rules the waters, and delivers from impending calamities: yet these three sages are but one first cause.

This triune power presides over divinities, and rulers, the sun, moon, stars, and constellations, and sends a celestial messenger to announce the pardon of sin, infinite happiness, and complete deliverance from evil, to all who shall recite his precious name, with many magnificent epithets superadded. He is said to have become incarnate under some form or other, in seven different periods. The sect of Reason has other deities, such as the "supreme ruler," the "northern emperor," the "god of fire," &c., but the principal divinities are the three pure ones, united in one abstract essence, of which eternal reason is the basis and characteristic.

The sect of Fuh recognises "three precious ones," but they are, the *past*, the *present*, and the *future*, without attributes or perfections. This superstition was introduced from India, in the first century of the Christian era. It has numerous minor divinities, principally goddesses, presiding over individual and local events; numerous absurdities are connected with this system, and as it is extremely popular, it is considered more mischievous than the former.

In the system of Confucius, which constitutes the sect of the *Learned*, the first cause is variously designated as reason, heaven, supreme ruler, supreme heaven, and heaven and earth. The term *Taou* is applied to express an eternal, unchangeable, omnipresent being, so vast that it fills the universe, so minute that it is contained in all things. This Taou is said to be the source of the changes which occur in nature. It is a divinity from whence issued heaven, earth, man, and all natural objects. The term also signifies a path, or mode of access, as well as a *word*, or medium of communication, and Professor Kidd directs attention to the remarkable coincidence of properties in this divinity, with those appropriated by the Saviour, or ascribed to Him by his inspired servants: "I am the *way*, the *truth*, and the *life*;" "In the beginning was the *Word*."

Heaven and earth are the most common deities invoked by the government and people. On state occasions the emperor offers bullocks in sacrifice. They are offered to heaven at the winter solstice, and to earth at the summer solstice; also to local deities, to the deity of the sea; the god of literature; the manes of the dead; the queen of heaven, (a young woman said to have been translated to heaven), the inventors of law, medicine, and other useful arts and professions.

The Chinese are much excited by hopes or fears on the occurrence of eclipses, comets, meteors, earthquakes, inundations, &c. They attribute an eclipse to the circumstance of a dog eating part of the sun or moon, and accordingly they make loud noises with gongs and other instruments to frighten the animal away. The term for eclipse is—"eaten sun or moon."

Among the translations from native records those relating to the Flood are very remarkable. This event is placed by the Chinese system of chronology in the year of the world seventeen hundred and thirteen, only fifty-seven years later than the generally received date. The following dialogue is represented as taking place between *Yu*, the Chinese Noah, and the emperor *Yaou*. The emperor says,—

Approach the imperial throne, you have abundant communication to make. Yu worshipped and said, May it please your majesty how can I speak? My thoughts were unweariedly and incessantly employed day by day. The deluge rose high, and spread wide as the spacious vault of heaven; buried the hills, and covered the mountains with its waters into which the common people, astonished to stupefaction, sank. I travelled on dry land in a chariot, on water in a boat, in miry places on a sledge, and climbed the sides of hills by means of spikes in my shoes. I went from mountain to mountain felling trees; fed the people with raw food; formed a passage for the waters to the sea on every part of the empire, by cutting nine distinct beds and preparing channels to conduct them to the rivers. The waters having subsided, I taught the people to plough and sow, who, while the devastating effects of the flood continued, were constrained to eat uncooked food. I urged them to barter such things as they could spare for others of which they stood in need. In this way the people were fed, and ten thousand provinces restored to order and prosperity.

The tradition does not allude to the sources of the calamity, nor to the resting-place of the people during its continuance. In the time of Yu wine was first made by E-Teih; but when Yu drank of it and relished its flavour, he banished its maker, and prohibited the luxury, remarking that in future ages nations would be ruined by it.

We cannot fail to trace in these particulars, as well as in the main features of the three principal sects, a feeble ray of light diffused from the only true source, and penetrating through the mists of heathenism, yet so faint is its beam, that it seems to make the surrounding gloom the more apparent. The obscure notion of a triune power ruling over all, is not sufficient to restrain this people from gross idolatry. Thus we find that the Chinese revere various monsters, the deities of certain hills and mountains, which are said to control the

destinies of the human race. One is represented with the body of a tiger, having nine human heads; this is called the intelligent creature of a hundred souls: another is a crocodile with six heads and four feet: another a kind of deer with the body of a horse spotted like a tiger, having a white head and red tail, which, they say, makes a noise like a person singing. Other animals are represented headless, or with many heads of different kinds. The four supernatural animals that preside over the destiny of the empire are the stag, the phœnix, the tortoise, and the dragon; the last forming the national arms of China, depicted on imperial standards, and affixed to edicts, &c. Let us hope that all these absurdities will gradually be relinquished by the Chinese, in proportion as their intercourse with Christian nations becomes established and extended, and their knowledge of the sacred Scriptures promoted by Christian effort. There appears to be nothing in the character of the people themselves, to hinder the introduction and free diffusion of scriptural truth among them; for, considered apart from their rulers, they are a simple-minded, intelligent, and active people; anxious to communicate with foreigners, to join in the same march of improvement. Their stationary position, which is the result of their religion and the vain and complacent temper of their government, as well as of the isolated nature of the country, is thus eloquently sketched by a most competent and skilful authority on all subjects relating to the Chinese, and an ardent friend to the cause of spiritual and temporal improvement among them—the Rev. Mr. Gutzlaff:—

Separated from the continent of America by the great ocean, bounded by dreary deserts and towering mountains, the insular position of China was traced by the hand of the God of Nature. Conquerors eager to sway the sceptre of the world, approached the frontiers of China as forbidden ground, and recoiled at the insurmountable obstacles which precluded their farther progress in the career of victory. Thus isolated from the world, and fortified against foreign invasions, China raised its head and preserved its existence, whilst all the empires around it, how powerful soever, decayed and became a prey to the mighty spoiler. The Assyrian, Babylonian, Persian, and Grecian monarchies, have successively occupied Western Asia; new empires have risen upon the ruins of fallen greatness; the countries have changed their aspect; new nations and languages have sprung up;—but China has undergone, in the mean time, few changes. The invincible Romans have long fled before the conqueror; Europe has repeatedly been overwhelmed by swarms of barbarians; it has been divided and subdivided, and wholly remodelled according to the choice of the new occupants; yet China has kept up its ancient customs, and retained the race which from time immemorial inhabited it. When, finally, hungry barbarians encroached upon its territory, and afterwards conquered it, the victors were lost amongst the myriads of its original inhabitants, and after a few generations, amalgamated with the conquered. Whilst civilization has advanced with rapid strides, taking an extensive tour over the globe, it was not able to overstep the barrier which an anti-national Chinese policy created around the Celestial Empire. Still it is absolutely separated from the whole world, and views with indescribable contempt every other country. To draw a line of demarkation, it assumes the title of Celestial, and styles itself the Middle Kingdom; all other nations are barbarians, doomed to live at the extremity of the square-cornered earth, or upon some small islands in the four seas which surround the Middle Kingdom. Conscious of its majesty, which is enhanced by a venerable age, it assumes the universal empire of the world, keeps the barbarians in subjection, sways the four seas, and always rules by compassion. With equal tenderness it embraces all countries, but at the same time leaves distant barbarians to their lot, if they are so stupid as not to acknowledge the supremacy of the only civilized nation in the world. Considering even the presence of barbarians contaminating and destructive to its ancient institutions, it keeps them at a respectful distance, and stigmatizes with the ignominious appellation of traitorous natives, those of its degenerate sons who dare to mix with so vile a race.

SNOW THIRST.

Before the perusal of a book of travels, the intelligent reader has a general idea of the scenes which his author describes, and can almost foretell the nature of the toils, the risks and the dangers which the traveller has encountered. It is by anticipations of this kind that we are disposed to draw our chair a little nearer to the fire the moment we prepare to peruse such interesting books as Parry's *Polar Voyages*, or Franklin's *Travels to the Shores of the Arctic Sea;* and it is thus too, owing to previously formed associations, that the very mention of Africa sets our imagination to work among unwholesome marshes and scorching sands, venomous reptiles and vindictive savages.

But in reading or thinking of snow-covered countries, we are scarcely aware of a singular and almost incredible fact, and scarcely recorded by travellers, namely, that during winter, on the cold and snow-covered plains of North America, man is exposed to the most painful of the many privations connected with African discovery: that even while walking on frozen water, he is agonized by parched and burning lips: and that by snow, eaten under such circumstances, the thirst of the traveller or hunter is proportionally increased.

Attention was called a few years ago to this singular fact by Mr. Sloane, who, in a communication to Professor Jameson, describes a few of the results of his own experience. From this source we gather the following particulars. In the higher latitudes of North America, all the snow falls at the commencement of winter. Clear skies, and an intensely cold atmosphere, characterize the climate, until warmer airs, and fogs, and flights of birds, intimate the approach of spring. During winter the sun has sufficient power to melt a small portion of the surface of the newly fallen snow, which is frozen by the next night's cold, thus forming a glassy surface on which the sledge glides rapidly, and the hunter on his broad snow-shoes, travels with an ease very different from that which he experiences on entering the woods, where the snow is always soft.

At such a season the fur-bearing animals are in best condition, and the fur-hunters full of activity. During their long excursions they often suffer great agony from thirst. It is not certainly so bad as that endured by travellers in the torrid zone, because a speedy and certain remedy is generally at hand; but it is truly painful while it lasts, and the sufferer is surprised to find that by eating snow his mouth is more and more inflamed, and his desire for drink fearfully increased, while a faintness and weariness come over him, which water and water only can dissipate.

More than once (says Mr. Sloane) when traversing wide plains, where the snow, resting on the long rank grass, stretched out in all directions a smooth, white, unbroken surface, till it terminated in the horizon, I have seen a party of men tearing up the *houses* built by musk rats, in swamps formed during the summer rains, in hopes to get at the water which sometimes lies below them, and then drinking that foul and stinking water with the utmost avidity.

But it is only on the plains that the experienced hunter is exposed to such hardships. When he has to perform a long journey in winter, an essential article of his equipment is a small pot or kettle, in which snow is melted and the water boiled. It is necessary to boil the water, because if the snow be merely melted, the water has a smoked and bitter taste, and is not refreshing to drink: but when the water is boiled and then cooled by throwing into it a quantity of pure snow, no spring water is more delightful to the taste, or more satisfying to the wants of the thirsty traveller.

In the woods and sheltered places there is seldom any difficulty in procuring this refreshing drink; but on the plains no fuel can be procured: the cold, too, is so intense as to render a delay to look for fire-wood often

most hazardous, and at all times very inconvenient· for, should the wind become violent, it tears up the surface of the snow, and bears it along in such clouds as to obscure the sun, and to hinder even the Indian for days from proceeding on his journey.

In such situations the value the Canadian attaches to his dogs can be most correctly appreciated. The stranger who sees the voyageur paying fifty pounds for three *small* animals, is disposed to laugh at the simplicity of the purchaser. Larger animals of the same kind would unquestionably appear more deserving of the price: but even the largest, most men would be disposed to think, were at that sum far too dearly purchased. But suppose this Canadian overtaken by such a storm, in the middle of an extensive plain; ignorant of the direction of his home; the path leading to it covered, in many parts, with ten or twelve feet deep of snow; and the atmosphere so filled with drift as to render it impossible for him to see the foremost of his three little dogs,—this man, apparently so helpless, so certain of being lost, who prides himself in watching and directing, on other occasions, even the slightest movement of his canine companions, throws himself on his sledge, calls to the animals to advance, leaves it to them entirely to determine what direction they shall take. This anxiety about his safety, if at all excited, lasts only while they are dragging him in all directions, to recover the true path; for by the barking of the leader he quickly learns that the track has been regained: and then sweeping, like the wind, over the slender crust of snow, through which larger dogs sink and flounder, and perish with fatigue, he is carried to his own fort, or to the nearer tents of some friendly Indians.

Sometimes the traveller finds it safer to remain until the storm has passed or somewhat subsided. It seldom continues long, and fair weather invariably succeeds; and as there may be many tracks in opposite directions, and as the sagacity of the dogs cannot then determine the one which conducts to the post their master would arrive at or avoid, he takes off their traces and gives them a little food; changes his mocassins and puts dry socks about his feet; then rolls himself in his blanket or buffalo skin; and with his gun by his side, lies down *deep* among the snow. With these necessary precautions, a human being may convert the snow into a safe, warm, and comfortable bed, when the thermometer is many degrees below zero, and when to sleep on its surface, even if wrapped in leather, would be followed by immediate and certain death from the effects of the intensely cold and penetrating wind. The dogs come and stretch themselves upon their master. The whole party are soon asleep,

and in such a resting-place many besides myself (says Mr. Sloane, in feeling and eloquent language,) have spent a solitary yet comfortable night, in the neighbourhood of wolves, with many miles between us and any other human beings, and risen next morning in health and strength, to proceed on our journey, and to offer thanks to a watchful Providence who had not only protected us during the night, but who had led us back in our dreams, to our distant country and homes, and who had surrounded us, while thus sleeping on our snowy couch, with the forms of the friends and companions most deserving of our love.

THAT *the voice of the common people is the voice of* GOD, is the common voice of the people; yet it is as full of falsehood as commonness. For who sees not that those black-mouthed hounds, upon the mere scent of opinion, as freely spend their mouths in hunting counter, or like Actæon's dogs in chasing an innocent man to death, as if they followed the chace of truth itself, in a fresh scent. Who observes not that the voice of the people, yea of that people that voiced themselves the people of GOD, did prosecute the GOD of all people, with one common voice, *He is worthy to die.* I will not therefore ambitiously beg their voices for my preferment: nor weigh my worth in that uneven balance, in which a feather of opinion shall be moment enough to turn the scales and make a light piece go current, and a current piece seem light.—ARTHUR WARWICK.

EASY LESSONS ON REASONING.

LESSON I.

§ 1. EVERY one is accustomed more or less to employ Reasoning. There is no one that does not occasionally attempt, well or ill, to give a Reason for any opinion he entertains;—to draw Conclusions from what he sees around him,—to support those conclusions by some kind of Arguments, good or bad,—and to answer the arguments brought against him.

Now all these expressions,—"giving a reason"—"drawing a conclusion"—"bringing forward an argument"—relate to one and the same process in the mind, that which is properly called "Reasoning." And the same may be said of several other expressions also; such as "inferring" or "drawing an inference,"—"proving a point,"—"establishing a conclusion,"—"refuting an argument,"— &c. All these expressions, and some others besides, have reference, as we have said, to the process of Reasoning.

§ 2. And this process, it is important to observe, is, in *itself*, universally, the *same;* however different the subject-matter of our reasoning may be, on different occasions.

The same is the case with Arithmetic. We may have to add, or subtract, multiply, or divide, certain numbers, either of Pounds-sterling, or of men, or of bushels of corn, &c., but tho' these are very different things, the *arithmetical-process itself,* in each of the operations, respectively, is always the same. For instance, to "multiply" always means to take one number a certain number of times; whether it be men, or miles, or days, that we are numbering.

So it is also with Grammar. The Nouns and Verbs, and other Parts of Speech that Grammar treats of may relate to very different subjects, and may be found in various kinds of Compositions; such as works of Science, History, Poetry, &c., but the rules of Grammar are the same, in all.

So also the art of Writing (and the same may be said of Printing) is in itself the same, however different may be the kinds of subject-matter it is employed on.

Now the same is the case (as has been above said) with Reasoning. We may be employed in reasoning on human affairs, or on Mathematics, or on Natural-history, or Chemistry, or other subjects widely different from each other. But in every case the Reasoning-process is, in itself, the same.

§ 3. Any Debate, [or Disputation] when you are endeavouring to bring others over to your opinion, is *one* of the occasions on which Reasoning is employed; and the word "arguing" is by some persons understood as having reference *only* to cases where there is a *dispute* between those who are maintaining opposite opinions. But this is a mistake. At least, it is a mistake to suppose that the use of "Arguments"—if we understand by that, the use of Reasoning—is confined to the case of *disputes;* or even that this is the *principal* employment of it. There is no set of men less engaged in dispute and controversy than Mathematicians; who are the most constantly occupied in Reasoning. They establish all their propositions by the most exact proofs; so complete as not even to admit of any dispute.

And in all other subjects likewise, a sensible man when he wishes to make up his mind on any question will always seek for some sufficient "Reason" [or "Argument"] on which to found his conclusion.

Thus, a Judge, before whom any Cause is tried, is occupied in weighing the Arguments on both sides, that are brought forward by the respective Advocates. He (no less than they) is engaged in Reasoning; tho' the Advocates are *disputing,* and the Judge is not.

A Physician, again, reasons from what he has read, and heard, and seen, in order to draw his conclusions on medical questions;—a Statesman, in political questions;

—a Merchant, in mercantile matters; and so, of the rest.

§ 4. But when any dispute does take place, between persons of opposed opinions, it may be observed that the worst-educated,—those who are the most unskilful, in reasoning, or in clearly expressing their reasons,—are almost always the most apt to grow angry, and to revile each other, and quarrel.

And even when they do not give way to anger, they usually, after a long discussion, part, without distinctly understanding what the difference between them really consists in: neither of them having clearly expressed his own meaning, or fully understood the other's.

Indeed it often happens that two persons who are disputing, do, in reality disagree much less in their opinions than they themselves imagine; or perhaps, not at all. And hence it is that the word "misunderstanding" has come to signify, a *quarrel;* because quarrels so often arise from men's not clearly understanding each other's meaning.

Again, it often happens that a person not without good sense, will give such weak and absurd reasons for his opinion, even when it is a right one, that instead of convincing others, he will even produce an opposite effect.

§ 5. In order to avoid such inconveniences, and to conduct the process of Reasoning as clearly, as correctly, and as easily, as is possible, it is a great advantage to lay down accurate explanations of the *principles* on which Reasoning proceeds, and to employ for the purpose a technical *language;* that is, a regularly-formed set of expressions, distinctly defined, and agreed on; and to establish certain plain simple *rules*, founded on, and expressed in, this technical language.

Even in the common mechanical arts, something of a technical language is found needful for those who are learning or exercising them. It would be a very great inconvenience, even to a common carpenter, not to have a precise, well-understood *name* for each of the several operations he performs, such as chisseling, sawing, planing, &c., and for the several tools [or instruments] he works with. And if we had not such words as Addition, Subtraction, Multiplication, Division, &c., employed in an exactly-defined sense, and also fixed rules for conducting these and other arithmetical processes, it would be a tedious and uncertain work, to go thro' even such simple calculations as a child very soon learns to perform with perfect ease. And after all, there would be a fresh difficulty in making other persons understand clearly the correctness of the calculations made.

You are to observe, however, that technical language and rules, if you would make them really useful, must be not only *distinctly understood*, but also learnt, and *remembered* as familiarly as the Alphabet; and employed *constantly*, and with scrupulous *exactness*. Otherwise, technical language will prove an encumbrance instead of an advantage; just as a suit of clothes would be, if, instead of putting them on and *wearing* them, you were to carry them about in your hand.

§ 6. It has been accordingly found advantageous, in what relates to the Reasoning-process, (as well as in the case of mechanical operations, and of calculations,) to lay down explanations, and rules, and technical terms; answering to those of Arithmetic, Grammar, and other branches of study.

And the technical terms and rules, of Grammar, are not at all shorter, or easier to be understood and remembered, than those pertaining to the present subject.

You may perhaps meet with treatises professing much more than what we here propose;—with works pretending to teach "the right use of Reason;" (not Reasoning, or "Argumentation" merely, but the whole of the *Human Intellect*) and giving rules for forming a judgment on every question that can arise, and for arriving at all truths in any subject whatever. But such pretensions, however high-sounding and attractive, are fanciful and empty. One might as well profess to teach the "right use of the bodily-organs," and to lay down a system of rules that should instruct a man in all manual arts and bodily exercises at once.

If you do but teach a person to ride, or to draw, or to spin, &c., something is gained: but if you should profess to lay down a system of rules to teach *all these at once*, and also the business of a shipwright, and a musician, and a watchmaker, and everything else that is done by means of the bodily-organs, you would teach, in reality, nothing at all.

And so it is in all subjects. It is better to undertake even a little, that it is possible to accomplish, than to make splendid professions which can only lead to disappointment.

After all indeed, it cannot be expected that, in Reasoning, any more than in other mental exercises, men of very unequal degrees of intelligence should be brought to the same level. Nor is it to be expected that men will always be brought to an agreement in their conclusions. Different men will have received different information respecting facts; or will be variously biassed, more or less, by their early prejudices, their interests, or their feelings.

But still, there is something gained, if they are taught, in respect of the Reasoning-process itself, how to proceed rightly, and to express themselves clearly; and if, when they do not agree, they can be brought at least to understand wherein they differ, and to state distinctly what is "the point at *issue*" (as it is called) between them; that is, what is the real question to be decided.

And it is just so, in the case of Arithmetic also. Two persons may differ in their statements of an Account, from their setting out with some difference in the *numbers* each puts down;—in the *Items* (as it is called) of the Account. And no rules of Arithmetic can prevent such a difference as this. But it is something gained if they are guarded (as arithmetical rules do guard us) against differences arising out of errors in the *calculation* itself.

A WARM SUNNY DAY IN WINTER.

So bright, so beautiful the day,
So sunny and serene,
I almost think the month of May
Has stolen in unseen:
And hoary Winter flies the while
Across the stormy wave,
To lose the lustre of her smile
In some dark northern cave.

The gurgling rivulets gaily run,
Freed from their icy chain,
As if they deemed the summer sun
Shone on the earth again,
And swiftly from each hill and dale,
Where'er is gently felt
The warm breath of the southern gale,
The snowy mantles melt.

Such sunny days in northern climes,
Where reigns the winter drear,
Gleam brightly through the storms at times,
The weary heart to cheer;
And many a soothing hope they bring,
And many a tale they breathe,
Of all the coming joys, when Spring
Her leafy crown shall weave.

Thus sometimes to the Christian's soul
E'en in a world like this,
Where clouds of sin and sorrow roll,
A foretaste of the bliss
Reserved for all the saints of heaven
In realms of endless day,
Is kindly for a moment given
To cheer him on his way.—WINSLOW.

LETTERS TO THE READER.

No. V.

MY DEAR READER,

Can you tell me how it happens in England, where comfort has been so successfully promoted by knowledge in the use of money, that our domestic architecture should still depend, as much as it does, upon styles, and taste so-called? There are certain conditions of moisture, temperature, soil, &c., that are peculiar to each country, of which, some are favourable, and others injurious, to animal health. Man, although capable of existing in every climate, is still susceptible of the influences of all, and the object of the builder should be to provide a shelter against external, injurious agents. In hot and cold latitudes, opposite states exist in nature, and should, therefore, be met by art with different adaptations. Yet in our own temperate climate, where the main object should be to invite air, and heat, and light, eastern verandahs darken both doors and windows. In our wet soils, with an atmosphere saturated with watery vapour, trellis-work of creeping plants spreading over the walls of houses, and thus preventing the drying action of the winds, is considered ornamental.

Supposing that we wanted to choose a dwelling, the first point of the inquiry, in every country, would be whether the situation were damp or dry. The necessity of draining wet soils for the purpose of rendering them fit for the production of a healthy vegetation, has long been recognised by the farmer. In districts, where the art of drainage was more generally adopted, a marked improvement also took place in the appearance and health of cattle. Fevers likewise less frequently attacked the inhabitants, and diseases of the lungs were not so numerous. In cases where the experience of these facts has been neglected, and new buildings have been raised over an unprepared foundation, disease has invariably followed. The town of Kingston, in Surrey, is tolerably well drained, and healthy; but being situated at an inconvenient distance from the Southampton Railroad, a new town bearing the same name was suddenly run up in the neighbourhood of the Station. But the soil on which this was built is retentive of moisture, and the under-drainage was imperfect. Fever therefore became frequent in Kingston-upon-Railway, while the old town remained comparatively free from the same disease.

If the dead animal and vegetable matter which lies upon the surface of the soil be either perfectly dry, or is dissolved in a large quantity of water, it is harmless to the health of man. But no sooner is this liquid solution of organized materials evaporated into the air than man and beast die of alarming disease. So long as floods stand upon lands, sheep are not attacked with the "rot," and the reason is evident. The poison is diluted with, and fixed in, water. But the more this fluid is evaporated by the sun, the stronger will be the putrid sediment. No longer fixed in water, but decomposed by heat, it rises as an invisible gas, or vapour, destructive to animal existence. Again, if the heat continue and the earth becomes parched, the danger ceases; the atmospheric vapour is dissipated. In Egypt even the plague dies away at the commencement of the hotter and drier months.

The rains which fall upon all the different kinds of rocks and soils readily sink through gravel and sand, and porous loams, but remain in considerable quantities upon clays. It is within the hopes of agriculturists to be able, either by mutual consent, or the assistance of the government, to drain the excess of surface-water *from* the strong clayey lands *to* the lighter and more porous soils, and thus improve both by the same operation. In its course to the lower levels it is proposed that the drainage water should circulate through towns and villages, and wash away all kinds of refuse, in the form of liquid manure for the use of the farmer. The sweepings of the streets of the town of Cape Coast upon the western shore of Africa are profitably washed for the gold-dust which is a product of that country. And the sweepings of our own streets, if washed in underground channels from the precincts of human dwellings into the liquid manure-tank of the agriculturist, would likewise produce not only gold, however, but an increased supply of food, as well as freedom from fever.

It is a common error to suppose that houses placed on high levels are dry and healthy. They are frequently neither the one nor the other. By an admirable economy of nature, much of the higher and sloping land is remarkably retentive of moisture by reason of the closeness of its mechanical structure, designed for the manifest purpose of preventing the too rapid gravitation of the watery food of plants. If hills were universally composed of porous rocks, and valleys were covered with impervious clays, the rains would soak through the former, and leave them barren, while the valleys would be changed to lakes. The husbandman would then be compelled to raise, at a vast expense of time and labour, the water essential to the production of vegetable food. The present merciful conditions, however, ask only the exercise of reason to regulate its ultimate distribution. But the diseases that are produced by the evaporation of neglected surface-water remind man of the absolute necessity of using up this unemployed capital of nature.

Of what materials should the walls of houses be composed? Porous stone, and bricks that are not thoroughly burnt, will absorb moisture from the ground, and give it out into the rooms. To prevent this it is necessary that the foundation should be constructed of materials calculated to resist the action of water. For this purpose slates are often laid above the mould, but these are soon destroyed by damp. Even Roman cement has been found too porous. Dark coloured bricks, having a glazed or partially vitrified surface, laid in a bed of concrete, (which is a mixture of lime with river gravel) forms, however, an excellent foundation. It has been suggested that a course of well-burnt bricks set in asphalte, or mineral bitumen, would effectually prevent the absorption of water, and a favourable opinion of this plan has been expressed by intelligent architects.

A thatched roof is very picturesque, and harmonises prettily enough with the rural landscape, but is a dangerous fuel to accidental fire, and is objectionable in other respects.

The cottages at Waddesdon, and some of the surrounding parishes in the Vale of Aylesbury, are constructed of mud, with earth floors, and thatched roofs. The vegetable substances mixed with the mud to make it bind, rapidly decompose, leaving the walls porous. Thatch placed in contact with such walls speedily decays, yielding a gas of the most deleterious quality.

Thirty-one persons residing in Binton and two other villages in the neighbourhood of Stratford-on-Avon, were attacked in the *winter* of 1839 with what is called *autumnal* fever; which is a disease produced by the decomposition of the dying vegetation of the summer. Seven of the cases proved fatal. Dr. Thompson, of Stratford-on-Avon, observes:—

As almost all the cottages in which there had been fever were thatched, and the thatch in many of them was in a very rotten and insufficient condition, it is not improbable that slow decomposition in the thatch from the unusual quantities of rain which had fallen might have been going on and contributed to the production and continuance of the fever. It has been observed by others, I believe, that it is more difficult to get rid of fever in thatched than in slated cottages.

In these instances the fires within the dwellings acted the part of the autumnal sun; and vegetable matter rotting under the united influences of heat and moisture

produced, as it ever will, the infection of a dangerous disease.

It is important that the ground floor should, for the sake of dryness, be raised above the level of the surrounding country. But if the kitchen should be underground, this will not be habitable, whatever may be the nature of the soil in which it is sunk, unless the drains are carried still lower in the earth. Where this has not been done, I have seen bars of soap, placed in such a situation, melt down, as it were, into a shapeless mass, and partially dissolved away by condensed atmospheric moisture. After continued rains water may be seen standing for days in the open areas of some of the finest mansions at the western part of the metropolis, whereas the poorest cottage built on a better level with respect, either to the natural or artificial means of drainage, would be clean and dry

> Something there is more needful than expense,
> And something previous even to taste—'tis sense;
> * * * * *
> 'Tis use alone that sanctifies expense,
> And splendour borrows all her rays from sense.

The red tiles and bricks with which many cottages are floored absorb large quantities of water. It has already been stated in the *Saturday Magazine**, that the Berkshire tiles used for this purpose, suck in, each of them, when they are washed, as much as half a pint of water. To prevent this porosity, it is the custom in the Mediterranean, where dwelling-houses are mostly flagged with stones, to saturate them with oil when they are first laid down. In other instances they are painted with ornamental patterns in imitation of mosaic work. Mr. James Smith, of Deanston, near Stirling, has introduced into his cotton-mill a thin flooring of wood over a solid base of stone, and it has been observed that his workmen are less subject to rheumatic and other affections of the joints than others who are accustomed to stand upon unprotected stone.

The shaft of the chimney is frequently too large and too short in the smaller tenements. The wind, when the atmosphere is clear and light, forms a strong ascending current which carries off much of the heat of the fire that would be otherwise radiated through the room. When, however, the weather lowers, the descending currents of cold air, and smoke, destroy the comfort of the inmates.

If the chimneys constantly smoke, a loss of health *must* follow. I do not say that disease, so well defined as to receive its artificial name from the physician, will invariably make its appearance; but that the average amount of health enjoyed by a family under such a condition will be lowered. The first act of breathing is to inspire atmospheric air. Oxygen gas, of which this air is, in part, composed, is essential to the purification of the blood from carbon. But if we confine a few cubic feet of air in a sitting room, and by means of an ill constructed chimney, diffuse smoke, which is a form of carbon, throughout the apartment, we compel the lungs to breathe more of the very substance with which the blood is already saturated, and which it is the function of the lungs to remove. Overcrowding public or private places of assembly, where the breathings of a mass of people saturate the confined air with carbon, produces the same effect.

I sat, (says a philosophical traveller,) three hours in the gallery of the senate chamber (United States), and afterwards experienced those debilitating, irritable, and unpleasant sensations which are generated by imperfectly decarbonized blood.

Connected with this part of the subject is the error of allowing trees to overhang, or creeping plants to cover, the walls of houses. Thereby light, and heat, and air, are obstructed, insects are harboured, and the wind prevented from carrying off the damp. It is true that vegetation, during daylight, performs the important function of absorbing from the atmosphere the excess of carbon that is exhaled by animals; leaving the oxygen free to be again inspired by the latter. But these results are not obtained by any local, or partial, action following human efforts. They are the general provisions of an omnipresent Creator. Gases are by nature's law diffused so rapidly that, notwithstanding the varied chemical actions which are constantly taking place upon the surface of the earth between inorganic and organized bodies, yet the main ingredients of atmospheric air are always found unaltered either as regards quantity, or quality. Foreign substances, such as smoke, gas, and animal and vegetable vapours, become mixed with air, and it is the duty, as well as the interest of man, to prevent this deterioration. But the beautiful economy of sustaining vegetable and animal life by providing that the one class of creations exhales what the other must inhale, and of ensuring an invariable uniformity of this aërial food, includes some of the most universal processes of nature, which are, therefore, far removed from the desultory superintendence of mankind.

Because vegetation is thus healthful in the mass, it by no means follows that trees are wholesome neighbours. If their roots run near the foundations of a house, they cannot fail to harbour a constant and injurious land-spring. The dew and rain hang heavily upon their leaves and branches, and the adjoining walls become painted with green and dank layers of incipient vegetation. Ivy and other climbing plants which are so beautiful when festooned with their natural grace and freedom from withered trees and crumbling ruins, lose their character when they choke the covered door-way, and intrude from stiff trellis-work into every window. The nets of the geometric spider, which in the summer months may be seen spread from point to point upon the vegetable wall, are of exquisite manufacture, but would be much more ornamental to the shrubbery. In short, I think that there is more real poetry, as well as science, in welcoming those natural influences of light and heat and air, which increase the health and consequently the happiness of homes, than in attempting to imitate, I need not say how unsuccessfully, the absence of art in nature.

The means of ventilation are more important than the size of the rooms.

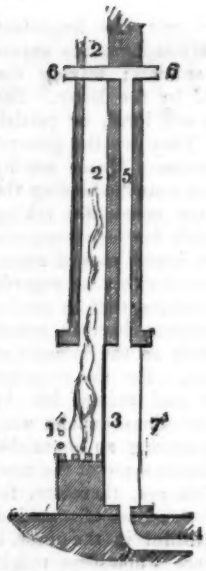
It has been assumed that apartments containing a certain number of cubic feet of space, are all that is requisite for life and health, whereas if a spacious drawing-room be completely closed against the admission of air, an inhabitant confined to it would in time be stifled, whilst, by active ventilation, or change of air, men working in connexion with diving-machines live in the space of a helmet, which merely confines the head.

Vitiated air not being seen, and the air which is pure in winter being cold, the cold is felt and the air is excluded. The great object hitherto has been to obtain a circulation of air which is *warm* as well as fresh.—*Sanitary Report.*

This end has been obtained, even for the poorest dwellings, by means of a simple and inexpensive stove which Sir Stewart Monteath has caused to be erected in his agricultural cottages. The following engraving represents a section of this stove, and a reference to the figures will explain its principle.

A four-roomed cottage can thus be well warmed below, and kept dry throughout, by means of one ordinary fire. You will not appreciate the value of the cheap and simple apparatus by which this object is obtained, unless you are fully acquainted with the effects of our cold and damp climate upon animal health. It may occur to you that the frequent mention which I make of the causes of bodily disease is out of place in the *Saturday Magazine*. But let me remind you while it is more especially the office of the physician to *cure* disease, that it is the undoubted duty of all to *prevent*, as far as reason will enable us, those physical causes which depress our moral and intellectual energies.

* See Vol. XXI., p. 247



1. *Kitchen fire.*

2. 2. *Chimney.*

3. *Hot air chamber.* This is a cast iron box, which forms the back of the kitchen grate.

4. *Cold air pipe, or passage;* made with brick, or stone, or iron piping, communicating with the open air for the purpose of feeding the hot air chamber with an ascending current of fresh air.

5. 5. *Hot air pipe,* receives the ascending current of air which becomes heated by passing over the back of the fire. At the top this pipe branches off at right angles, and terminates near the floor in the two sleeping rooms above.

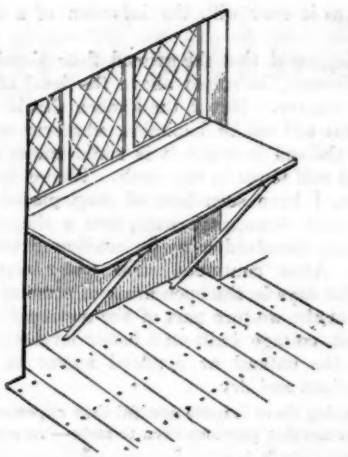
6. 6. *Gratings* to admit the warm air from the hot air pipe into the bedrooms. The addition of sliding valves over the face of the gratings would serve to cut off the current of warm air during the summer, and when otherwise required.

7. *Sitting-room,* into which sufficient heat is radiated from the hot air chamber, not only to warm the apartment, but even to dry wet linen.

Of these, as they exist in England, cold and damp are the chief. A hot *dry* air and soil, as at Malta, are proved to be remarkably healthy. A cold *dry* air and soil, as in Canada, are equally so; but heat with moisture, as in India, and cold with moisture, as in England, are both destructive of human life; although the rapidity with which diseases run their course in hot climates makes them more startling, and the deaths apparently more awful. But the slow and insidious causes, namely, damp and cold, that are at the present moment undermining the lives of thousands in this country, produce effects equally awful to reflective minds. The progress of natural knowledge is daily adding to the power which we possess over the healthy growth of society. It is, therefore, daily adding to our responsibilities, and unless we use up our facts for the good of all, Christianity will condemn us as a selfish generation. The time, I hope, is coming, when *education* will include the knowledge of such practical facts as bear upon the well-being of man, whom his Creator has commanded us to befriend.

I must not forget to observe, that to complete the means of ventilating the poor man's cottage, it is necessary that the windows should be made to open. Believing that this part of the lower class of houses was too expensive, and generally ill constructed, the Highland Society lately offered prizes for improvements in cottage windows. Various specimens were laid before the directors of the Society for inspection. Some were made of zinc, but these, as well as others formed of wood, and lead, would not admit of repair by the cottager himself, and it was deemed essential to cheapness, as well as to prevent the unsightly substitutes of paper, rags, &c., that the labourer himself should be able to replace a broken pane. Cast-iron frames were thought to be least objectionable, and these were manufactured at a cost of five shillings each, without the wooden frames.

The following convenient shutter for the cottage window will, I have no doubt, be generally adopted. Mr. Loudon, to whom we owe so many improvements in the structure of our dwelling-houses, describes it as hung on hinges in such a manner as to fall down into a recess below the window, during the day time; and consequently quite out of the way when not wanted for shutting up the house, or for temporary purposes. The idea suggested itself, that shutters be occasionally used as a table or ironing board; and to effect this end, two moveable bars as supports were let into mortices in the floor, and made to abut against similar mortices made in the ledges on the under side of the shutters. The two cornices were slightly rounded, and the upper surface was left plain without paint. Two swing iron or wooden brackets might be used instead of the wooden bars, as they could also be folded back into the recess.



A plentiful supply of pure water is an essential to cleanliness, and without cleanliness there can be neither bodily health, nor moral self-respect. If a river be the source of supply, it should be ascertained whether the sewers of the nearest town are not discharged into its channel. The comparative impunity with which the waters of the Thames are used for domestic purposes in London, has been explained by the calculation that its volume exceeds, by 10,100 times, that of the streams of impurities which are daily discharged into its bed. But during the warmer months the water dissolves a much larger proportion of its putrid contents. The sewers of the city of Cork are emptied into the river Lee, and several years ago, the troops at the old barracks, being supplied with the water of this river, were attacked with violent disease. The surgeon, suspecting the cause of the affection, employed a number of water-carts to bring water for the troops from an unpolluted spring called the Lady's Well. The sickness then disappeared.

The proximity to the dwelling-house, of a well-drained open space for bodily exercise, is of vast importance to the inhabitants of towns. In reference to this subject, the Registrar-general, in his *Third Report on Births, Marriages, and Deaths in England,* observes,

Neither the men, nor all the masters, appear to be aware that the respiration of pure air is indispensable; that the body requires as much care as their tools, instruments, and machines, and that without it neither the body nor the mind can be kept in health and vigour. The new parks and public walks will afford the artisan an opportunity of refreshing his exhausted limbs, and respiring the fresh air; and the health and temper of the sedentary workman may be much ameliorated by affording facilities in towns for athletic exercises and simple games out of doors, which, while they bring the muscles into play, unbend, excite, and exhilarate the mind.

I have now, my dear Reader, pointed out a few of the things which are more essential to the formation of a healthy dwelling, than the mere imitation of certain styles of architecture. It is true that "the external condition of the residence, and the apparent rank it holds, is not without a beneficial moral effect on the occupants, by increasing their self-respect and pride in the decencies of life." Yet so long as the means of healthy shelter are neglected; while, as Mr. Loudon says, "houses are bedaubed with ornaments that have not sufficient relation to use," and especially just at present, when the "*florid style*" is becoming fashionable, we may fairly use to the designers, the words which Pope applied to the mansion of a noble duke.

Thanks, sirs, 'tis very fine,
But where d'ye sleep, or where d'ye dine?
I find by all you have been telling,
That 'tis a house, but not a dwelling.

Believe me ever yours sincerely,

F.

JOHN W. PARKER, PUBLISHER, WEST STRAND, LONDON.